On page 2, between lines 18 and 19, please insert the following new heading --SUMMARY OF THE INVENTION--.

a5

Please replace the paragraph beginning on page 2, line 19, with the following rewritten paragraph:

a6 --It is an advantage of the present invention to improve the optical semiconductor device set out above.--

Please replace the paragraph beginning on page 2, line 23, with the following rewritten paragraph:

a7 --The present invention achieves this and other advantages through an optical semiconductor device with a multiple quantum well structure, comprising: at least one combination of alternating well layers and barrier layersboth further comprising various semiconductor layers, said well layers further comprising a first composition based on a nitride semiconductor material with a first electron energy, said barrier layers further comprising a second composition of a nitride semiconductor material with electron energy which is higher in comparison with the first electron energy, and a radiation-active quantum well layer, layered in direction of growth for which the well layers and barrier layers form a superlattice.--

Please replace the paragraph beginning on page 2, line 26, with the following rewritten paragraph:

a8 --The invention provides a multiple quatum well structure with well layers and barrier layers comprising various types of semiconductor layers which are layered alternatively one on top of the other. The well layers are thin layers of a first composition based on a nitride semiconductor material with a first electron energy. The barrier layers are layers which are thicker in comparion to the well layers, are of a second composition of a nitride semiconductor material and are with electron energy which is higher in comparison with the first electron energy. Acting as the radiation-active quatum well, seen in the direction of growth, is firstly one of the last quatum well layers or the last quatum well layer. The well layers arranged in front, which essentially do not radiate, and the barrier layers form a superlattice for this last layer.--

Please replace the paragraph beginning on page 3, line 5, with the following rewritten paragraph:

--According to an embodiment of the invention, in the superlattice, the well layers are thin aluminum-gallium-indium-nitride layers, the barrier layers are gallium-nitride layers which are thicker in comparison, and the active quantum well has indium-gallium-nitride.--

Please replace the paragraph beginning on page 3, line 19, with the following rewritten paragraph:

--In a particularly preferred development, at least one of the well layers of the superlattice has at least one pair of single layers, of which the first single layer, in the direction of growth, has a lower indium content than the second single layer. This well layer preferably has a plurality of single layers whose indium content increases step by step from the single layer lying furthest away from the radiation-active quantum well layer to the single layer lying closest to the radiation-active quantum well layer. It is particularly preferred for the steps of the increase in indium content to be smaller than 5%. It is also preferred for the indium content of the single layer furthest away from the radiation-active quatum well layer to be less than 5%. The thickness of the single layers preferably lies in the range of just a few monolayers~~,~~ and particularly preferably approximately one monolayer.--

Please replace the paragraph beginning on page 3, line 38, with the following rewritten paragraph:

--The particular advantage of the step-by-step increase in the In content is that a potential profile resembling a delta potential is produced, in particular in the case where the thickness of the single layers does not significantly exceed that of a monolayer. The difference in the energy level in the barrier layers and the energy level obtained for one electron in the well layer is consequently not greater than in the case of a rectangular well layer with a significanly lower indium content as the uppermost single layer of the stepped well layer. Accordingly, the advantages of a reduced overall indium content are retained, but the strain is at the same time influenced by the high indium content of the last single layer in such a way that the nucleartion of InGaN-rich phases is improved and, consequently, the quantum efficiency is increased.--

On page 5, between lines 14 and 15, please insert the following new heading --BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS--.

Please replace the paragraph beginning on page 5, line 19, with the following rewritten paragraph:

a13 --Figure 1a and 1b show a schematic representation of the layer structure of a device according to the invention,--

On page 5, between lines 32 and 33, please insert the following new heading:

a14 --DETAILED DESCRIPTION OF THE INVENTION--.

Please replace the paragraph beginning on page 5, line 33, with the following rewritten paragraph:

a15 --According to figure 1a, initially a buffer layer 3 of aluminum-gallium-nitride (AlGaN) is formed on a substrate 1 of silicon carbide (SiC), to which a first contact electrode 2 is connected. This is followed by a further layer 4 of aluminum-gallium-nitride. A further buffer layer 5 of silicon-doped gallium nitride is arranged over the layer 4. The quantum well structure 6a, 6b, still to be discussed in more detail, is arranged over buffer layer 5. Quantum well structure 6a and 6b are followed by the actual active layer 6c. Arranged over the active layer 6 is a further layer 7 of aluminum-gallium-nitride, which serves as an electron barrier. This layer 7 is preferably doped with magnesium. A further GaN layer, not designated, may be arranged between the layers 6 and 7. A gallium-nitride layer 8, on which a second contact electrode 9 of the device is provided, is arranged over the layer 7.--

Please replace the paragraph beginning on page 6, line 18, with the following rewritten paragraph:

a16 --The buffer layer 3 functionally serves as a growth layer, which is required to allow the LED structure to grow on the silicon carbide substrate 1. The further aluminum-gallium-nitride layer 4, between the layers 3 and 5, has an aluminum content which changes in the direction of the gallium-nitride layer 5. The gallium-nitride layer 5 is preferably silicon doped. The layer 7 of magnesium-doped aluminum-gallium-nitride, arranged over the active layer 6, serves as an electron barrier.--

Please replace the paragraph beginning on page 6, line 28, with the following rewritten paragraph:

a17 --This basic structure of figure 1a can be used as a standard for gallium-aluminum-indium-nitride light-emittind diodes (LEDs).--

Please replace the paragraph beginning on page 7, line 13, with the following rewritten paragraph:

q18

--The indium content lies below 24%, preferably however below 20%, and is therefore preferably reduced in comparison with customary indium contents. The layers 6a and 6b, depicted only once in the figure, may be arranged repeatedly one above the other. The layers may be structured repeatedly x=3 times. The uppermost gallium-nitride layer 6b is followed by the actually active, i.e. illuminating, layer 6c of indium-gallium-nitride.--

Please replace the paragraph beginning on page 8, line 4, with the following rewritten paragraph:

q19

--The use according to the invention of GaInN/GaN superlattices with thin wells (to a quantum well width of approximately 2 nm) in a layer structure according to figure 1 and with quantum well conditions according to figure 2 allows the forward voltage to be significantly lowered and, at the same time, the high internal quatum efficiency of the indium-gallium-nitride based optical semiconductor device to be maintained. The piezo fields, otherwise formed, are avoided entirely or have virtually no effect any longer. In comparison with customary single quantum-well structures, in which no gallium-indium-nitride superlattice is deposited before the active well, the device structure according to the invention has twice the conversion efficiency.--

In the claims:

Please replace the claims with the following rewritten claims:

q20

--1. An optical semiconductor device with a multiple quantum well structure, comprising: at least one combination of alternating well layers and barrier layers both further comprising various semiconductor layers, said well layers further comprising a first composition based on a nitride semiconductor material with a first electron energy, said barrier layers further comprising a second composition of a nitride semiconductor material with electron energy which is higher in comparison with the first electron energy, and a radiation-active quantum well layer, layered in direction of growth for which the well layers and barrier layers form a superlattice.